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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/993,626

11/27/2001

Kiyohiro Yokoyama

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EXAMINER

LEFLORE, LAUREL E

ART UNIT

PAPER NUMBER

2673

DATE MAILED: 11/05/2003

6

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/993,626

Applicant(s)

YOKOYAMA ET AL.

Examiner

Laurel E LeFlore

Art Unit

2673

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 November 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Japan on 27 November, 2000. It is noted, however, that applicant has not filed a certified copy of the 2000-359678 application as required by 35 U.S.C. 119(b).
2. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Japan on 16 October, 2001. It is noted, however, that applicant has not filed a certified copy of the 2001-318587 application as required by 35 U.S.C. 119(b).
3. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Japan on 26 November, 2001. It is noted, however, that applicant has not filed a certified copy of the 2001-359390 application as required by 35 U.S.C. 119(b).

Specification

4. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.
5. The following title is suggested: Glass touch panel with hygroscopic fine particle adhesive.
6. The disclosure is objected to because of the following informalities: On page 1, third paragraph of Background of the Invention, line 3, "one" should be omitted. On page 1, fourth paragraph of Background of the Invention, line 4, "show"

should be shown. On page 3, fourth paragraph of Detailed Description of the Preferred Embodiments, line 6, "of a highly humidity condition, the" should be "in a highly humid condition; the". Also, on the last line of page 3, "feature" should be "features". On page 5, third paragraph under [Performance and Characteristics of Glass Touch Panel], line 5, "should attain 1000 hours" is understood to mean "should resist for up to 1000 hours". Also, on line 6 of the paragraph, "-95%RH" should be "and 95%RH". Also, on line 7, "attain" should be "maintain".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 19 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In regard to claim 19, it is unclear to what the dynamic range applies. The ranges of lower and upper limit voltages may be understood to be claimed applied voltages or claimed voltages transmitted as indication of contact with the touch panel. Also, it is unclear if the claimed voltages exist between either 0 and .7 V or 5 and 4.6 V or if the claimed voltages exist in the range between the lower and upper limit voltages.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1, 7-11, 13, 14, 16 and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato 6,507,337 B1 in view of Nishijima et al. 4,942,364.

In regard to claim 1, Sato discloses a glass touch panel comprising a pair of transparent substrates, a touch substrate and a display substrate. Each of the upper and lower substrates has a transparent conductive film surface and is opposed to the other at the transparent conductive film surface. See column 1, lines 27-30, which discloses that the "surface of each substrate, that is facing the other substrate, is covered by a thin layer of indium/tin oxide as a transparent conductive layer. The lower transparent substrate is glass as disclosed in column 1, lines 26-27, "The display substrate is made of soda-lime or tempered glass." The display substrate is understood to be the lower substrate, and the touch substrate is understood to be the upper. The upper substrate, unlike the claimed invention, is made of polyethylene terephthalate, polycarbonate, or poly methacrylate resin that is transparent (see column 1, lines 23-24), instead of glass. In column 2, lines 43-49, Sato discloses that using glass as a substrate is well known ^{but} ~~by~~ may make it "impossible to keep the glass from being broken

when strong mechanical impact is given...The glass should be replaced with a transparent resin film, such as polycarbonate or polymethyl methacrylate, that is relatively thin and has a proper rigidity." It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Sato by using glass for the substrate. One would have been motivated to make such a change in order to have a simpler substrate without concern for mechanical impact, particularly in applications where the drawbacks of glass are not a concern or where simpler cheaper material is preferred. The touch panel disclosed by Sato is also different from that of the claimed invention in that Sato does not bond the two substrates with an adhesive mixed with hygroscopic fine particles. Nishijima et al. discloses an adhesive mixed with hygroscopic particles. The hygroscopic mixture is the moisture sensing resistive substance of Nishijima's invention, as disclosed in column 6, lines 43-47. Here he further discloses that the moisture resistive substance is "capable of changing an electrical resistance...by absorbing a moisture." Hence, (see column 2, lines 18-22) the invention has "a quick response speed upon a change of humidity and a low amount of dew condensation". The adhesive properties of the moisture sensing resistive substance are inherent as evidenced by column 5, lines 32-34, which disclose a suggestion for increasing the adhesion of the moisture sensing resistive substance to the fiber surface. The fiber substance is a glass fiber as specified in column 6, lines 35-40. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the glass touch panel

of Sato to use an adhesive mixed with hygroscopic particles to bond the substrates. One would have been motivated to make such a change based on the teaching of Nishijima to provide "a quick response speed upon a change of humidity and a low amount of dew condensation", as well as to have a moisture resistive substance that is "capable of changing an electrical resistance...by absorbing a moisture."

In regard to claim 7, Sato discloses in column 7, lines 15-23, a hard coat layer 11 (see figure 2), that "is formed from a silicon base, acrylic base, cellulose base, melamine base, or urethane base resin that is light-hardening type...the hard coat layer 11...is hardened by ultraviolet light". Hence, Sato discloses a thermosetting UV setting acrylic type hard coat layer. He further discloses in column 7, lines 30-32, that "It should be noted that the hard coat layer 11 is provided for the purpose of improving the durability of the touch panel". The difference between this layer as disclosed by Sato and that of the claimed invention is that the hard coat layer disclosed by Sato is not an adhesive. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Sato to include an adhesive with the UV setting acrylic properties of Sato's hard coat layer. One would have been motivated to make such a change based on the teaching of Sato to provide such a layer "for the purpose of improving the durability of the touch panel".

In regard to claim 8, Sato discloses in column 13, lines 56-58 that the "visible light transmittance at a wavelength of 550 nm is shown in the rightmost

column of Table 3 for each of the films F5 to F10.” Referring to Table 3, transmittance values of between 90.5% and 95.2% are disclosed. He further discloses in Table 2 that the transmittance of touch panels F3TP and F4TP are 90%. These values are greater than 85%.

In regard to claim 9, Sato discloses in column 5, lines 37-38, that “a wide operating temperature ranged from -40°C to 100°C can be provided for the touch panel. This range of temperatures includes the temperature range of -30 to 65°C. In column 10, line 57, Sato further discloses the condition of a humidity of 90%, or 90% RH.

In regard to claim 10, see rejection of claim 9. The wide operating temperature ranging from -40°C to 100°C includes the temperature range of -40°C to 85°C. It is understood that a touch panel with such operating temperature characteristics would have equivalent storing temperature characteristics. Also, 90% RH is “95% RH or less.”

In regard to claim 13, Sato in view of Nishijima discloses a glass touch panel similar to that of the claimed invention. See rejection of claim 1 for similarities. Sato in view of Nishijima differs from that claimed in claim 13 in that the thickness of the two substrates in Sato’s invention are not disclosed. However, these thicknesses are conventional and readily available. As evidence of this, see page 6 of the applicant’s specification, first sentence underneath Table 1, stating, “Commercial products can be used for such glass having the above properties.” The “above properties” include the thickness of the glass. It

would have been obvious to one of ordinary skill in the art at the time to modify the invention of Sato in view of Nishijima by using glass of thickness specified in claim 13. One would have been motivated to make such a change in order to use glass that is already commercially available, and these thicknesses are typical of the glass used in those types of systems.

In regard to claim 14, Sato discloses in column 3, lines 16-18, that the "transparent conductive layers are formed according to the vacuum film-thinning technique such as the sputtering method". It is understood that sputtering deposits vapor in a predetermined shape.

In regard to claim 16, Sato discloses in Table 2 that the linearities for touch panels F2TP, F3TP and F4TP are 3.5% or less.

In regard to claims 11, 18 and 19, an electrostatic withstand voltage of 15kV or more and a voltage range from 0 to 5 V is understood to be common in inventions of this kind. See the reference "Resistive Analog Touch Panels" which includes a variety of touch panels tested under conditions of 25kV (see page 3) and a rated voltage of 7V. Also see page 4, which discloses the use of a rod of 8mm diameter and hardness 60° which applies a load of 200g. Thus, using a rod of the type specified in claim 11 to test an operation load that is up to 200g is common.

In regard to claim 20, Sato discloses a touch panel much like that of the claimed invention. See rejection of claim 1 for similarities. However, Sato does not disclose that the touch panel's transparent glass substrate is 2 to 20 in. This

size has no disclosed criticality according to the specification of the claimed invention. It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the transparent glass substrate of any size, for instance 2 to 20 inches. One would have been motivated to make such a change in order to have a touch panel that is of operable size and that is suitable for the application for which the panel is intended.

9. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sato 6,507,337 B1 in view of Nishijima et al. 4,942,364 as applied to claim 1 above, and further in view of Iwanaga et al US 2001/0030730 A1.

Sato in view of Nishijima disclose a glass touch panel similar to that of the claimed invention. See rejection of claim 1 for similarities. Sato in view of Nishijima differs from that claimed in claim 2 in that the hygroscopic fine particles are not specified as being 50 μm . or less in diameter. Sato in view of Nishijima is silent on the point. Iwanaga et al. discloses a liquid crystal display on page 7, paragraph [0130] that "hygroscopic particle of polymer 5 are also printed on the periphery of the substrate 1A to form a dampproof seal." In paragraph [0024], Iwanaga et al. further discloses that the "polymer particles may be in the form of fine particles and...may have an average diameter of 3 micrometers." It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the touch panel of Sato in view of Nishijima by using hygroscopic particles less than 50 μm . in diameter, or in particular, 3 μm . in diameter, as in

the invention of Iwanaga et al. One would have been motivated to make such a change in order to form a dampproof seal.

10. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sato 6,507,337 B1 in view of Nishijima et al. 4,942,364 as applied to claim 1 above, and further in view of Rainer 4,715,388.

In regard to claim 3, Sato in view of Nishijima disclose a glass touch panel similar to that of the claimed invention. See rejection of claim 1 for similarities. Sato in view of Nishijima differs from that claimed in claim 3 in that the hygroscopic adhesive is not mixed with a weight ratio of 10% or less. Sato in view of Nishijima is silent on the point. Rainer discloses in column 3, lines 35-36, "1% to 6% of a particulate nondeliquescent hygroscopic adhesive powder" as a hygroscopic adhesive method, stating, "The use of the method results in cigarettes having interadhered shreds". It would have been obvious to one of ordinary skill in the art at the time to modify the invention of Sato in view of Nishijima by mixing the hygroscopic adhesive with a ratio of 1% to 6%, or "10% or less". One would have been motivated to make such a modification in order to interadhere the substrates and because both systems show the process of using a hygroscopic adhesive to combine elements together.

11. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sato 6,507,337 B1 in view of Nishijima et al. 4,942,364 as applied to claim 1 above, and further in view of Kent et al. 6,297,811 B1.

In regard to claim 4, Sato in view of Nishijima discloses a glass touch panel similar to that of the claimed invention. See rejection of claim 1 for similarities. Sato in view of Nishijima differs from that claimed in claim 3 in that a silver electrode mixed with a glass fiber is not disposed at a predetermined position on an outer periphery of the transparent conductive film. Kent discloses in column 5, lines 48-56, and referring to figure 4, a method of connecting electrodes to a touch panel. "Interconnects 415-427 can be fabricated from silver-frit (e.g. on glass). Thus, a silver electrode is mixed with a glass fiber. The "electrodes are fabricated from a transparent conductive coating such as ITO", and are shown in figure 4 at a predetermined position at an outer periphery. Kent also states that this is one of "a variety of methods that can be used to electrically connect the electrodes of the present invention with the touchscreen electronics." It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the touchscreen of Sato in view of Nishijima by using the method of Kent for supplying electrodes to the touchscreen. One would have been motivated to make such a modification in order to have a method to electrically connect electrodes with the touchscreen electronics.

12. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sato 6,507,337 B1 in view of Nishijima et al. 4,942,364 and further in view of Kent et al. 6,297,811 B1 as applied to claims 1 and 4 above, and further in view of Swift et al. 3,779,878.

In regard to claim 5, Sato in view of Nishijima and further in view of Kent disclose a touch panel similar to the one of the claimed invention. See claim 1 and 4 rejections for similarities. Sato in view of Nishijima and further in view of Kent does not disclose that the glass fiber is mixed to the silver electrode with a weight ratio of 10% or less. Swift et al. discloses in column 3, lines 8-17, lines a silver paste for use as a conducting material on a glass windshield. The silver paste is "made up from 80 to 98 parts of powdered silver to form 2 to 20 parts of borosilicate glass frit". Hence, if the paste is mixed with 98 parts of silver and 2 parts of glass, the weight ratio of glass to silver is 10% or less. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Sato in view of Nishijima and further in view of Kent by mixing the glass fiber to the silver electrode with a weight ratio of 10% or less, as in the invention of Swift. One would have been motivated to make such a change based on the teaching of Swift in column 3, lines 14-18, that "commercially available silver-frit pastes have proved satisfactory and such pastes" have the properties as described above.

13. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sato 6,507,337 B1 in view of Nishijima et al. 4,942,364 and further in view of Kent et al. 6,297,811 B1 and further in view of Swift et al. 3,779,878 as applied to claims 1, 4 and 5 above, and further in view of "Paste for electronic materials".

In regard to claim 6, Sato in view of Nishijima et al. and further in view of Kent et al. and further in view of Swift et al. disclose an invention similar to that

disclosed in the present invention. See previous rejections of claims 1, 4 and 5 for similarities. Swift further discloses that the silver electrode is a commercially available silver-frit paste in column 3, line 14. However, Sato in view of Nishijima et al. and further in view of Kent et al. and further in view of Swift et al. does not disclose that the silver paste has an electric resistivity of $5.0 \times 10^{-4} \Omega\text{cm}$. The web article "Paste for electronic materials" discloses a variety of silver pastes for use in touch panels that have resistivity values between 6×10^{-5} and $2 \times 10^{-4} \Omega\text{cm}$. These values are less than $5.0 \times 10^{-4} \Omega\text{cm}$. However, the specification of the claimed invention states on page 5, first paragraph, that an electric resistivity of $5.0 \times 10^{-4} \Omega\text{cm}$ or less is preferable for realizing more effective smoothness. Again see the article "Paste for electronic materials" which discloses an excellent smoothness rating for many of the silver pastes. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Sato in view of Nishijima et al. and further in view of Kent et al. and further in view of Swift et al. to have a silver paste with resistivity of $5.0 \times 10^{-4} \Omega\text{cm}$. One would have been motivated to make such a change in order to have excellent smoothness based on the article "Paste for electronic materials", which discloses even lower resistivity values and excellent smoothness.

14. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sato 6,507,337 B1 in view of Nishijima et al. 4,942,364 as applied to claim 1 above, and further in view of Maeda et al. 6,310,614 B1.

In regard to claim 12, Sato in view of Nishijima discloses a glass touch panel similar to that of the claimed invention. See rejection of claim 1 for similarities. Sato further discloses in column 7, lines 2-7, and referring to figure 1, that "dot-shaped spacers 30, for example, are provided on the surface of the conductive layer 25 at regular distances, such as every few millimeters. The spacers 30 are made of light-hardening acrylic resin, and each spacer is about 10 μm in height and 10 μm to 50 μm in diameter". Hence the dot spacers are made of thermosetting resin, with a diameter from 20 to 100 μm . "Every few millimeters" is understood to be from 2 to 4 mm. Sato in view of Nishijima differs from that claimed in claim 12 in that the dot spacers of the touch panel do not have a height that is from 3 to 6 μm . Maeda et al. discloses in column 6, lines 13-17, and referring to figure 2, a touch panel, in which "dot spacers 6 have a height of about 5 microns, which is less than a height of a gap d between movable conductor layer 4 and fixed conductor layer 5. Dot spacers prevent accidental contact between movable conductor layer 4 and fixed conductor layer 5." It would have been obvious to one skilled in the art at the time the invention was made to modify the touch panel of Sato in view of Nishijima by making the dot spacers 5 μm in height as in the touch panel of Maeda et al. One would have been motivated to make such a change based on the teaching of Maeda that dot spacers should have a height less than the distance between the two panels, in order to prevent accidental contact between them.

15. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sato 6,507,337 B1 in view of Nishijima et al. 4,942,364 as applied to claim 1 above, and further in view of Tannas, Jr. 4,017,848.

In regard to claim 17, Sato in view of Nishijima disclose a touch panel similar to the one of the claimed invention. See claim 1 rejection for similarities. Sato in view of Nishijima does not disclose that bounce by an ordinary finger operation is 10 msec or less. Sato in view of Nishijima is silent on the point. Tannas, Jr. discloses a device that switches with finger touch. Tannas, Jr. further discloses that, "Switches of this type...have a contact bounce on the order of 10 milliseconds and thus illustrates the high quality of switches which may be constructed in accordance with the invention." It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Sato in view of Nishijima by having a bounce by a finger be 10msec or less. One would have been motivated to make such a change based on the teaching of Tannas, Jr. that 10 milliseconds is an excellent value for contact bounce and to have a high quality switch.

Conclusion

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

United States Environmental Protection Agency, Fourth External Review
Draft of Air Quality Criteria for Particulate Matter (June, 2003): Volume II,

Appendix A, <http://www.epa.gov/ttn/oarpg/t1/reports/pmspapac.pdf>, which discloses that fine particles are less than either 2.5 μm . or 1 μm .

Shores 5,591,379 discloses an adhesive having dessicant, and thus hygroscopic, properties for use in microelectronic devices.

Murakami et al. 6,559,834 B1 discloses a touch panel with a polarizing plate that has hygroscopic properties.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Laurel E. LeFlore whose telephone number is (703) 305-8627. The examiner can normally be reached on Monday-Friday 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bipin Shalwala can be reached on (703) 305-4938. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

LEL



JOSEPH MANCUSO
PRIMARY EXAMINER